2000 New Horizons

A popular winter activity in Yellowstone National Park and several other units of the national park system, recreational snowmobile use is being reevaluated.

It's very hard to create what you haven't experienced.... When you do bring it into reality it always looks and feels different than what you anticipated. Reality never shows up according to our plans exactly.

—Peter Senge
Author, global sustainability advocate, and
senior lecturer, Massachusetts Institute of Technology

Change is a hallmark of successful organizations, yet organizational change is never easy. To prepare for new situations and develop new capabilities is a constant process of anticipating future unknowns, capitalizing on new opportunities, and summoning the courage to create. But change is not always proactive or bold; often it is reactive and measured. Whatever the impetus, the National Park Service must continually strive to improve as caretaker of irreplaceable park resources. With the help of dedicated staff, innovative partners, and the caring public, in 2000 the National Park Service faced a variety of challenging and controversial natural resource management issues. As the following articles suggest, technological advances, public input, analysis of past actions and historical events, use of law, programmatic innovation, and, to a small degree, chance are shaping the future of natural resource preservation in the national park system. Collectively, the following articles represent adaptations that are leading toward new horizons.

Environmental impacts from snowmobiles scrutinized

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The flurry of activity surrounding snowmobiles in national parks reached new heights in 2000. The public sentiment and action sparked by this issue have brought much attention to NPS attempts to refine its snowmobile policy and ensure compliance with existing executive orders requiring monitoring of off-road vehicle use. To the Natural Resource Stewardship and Science Directorate, the issue of snowmobiles has proven to be an opportunity where natural resource information and expertise can help shape national policy and management decisions.

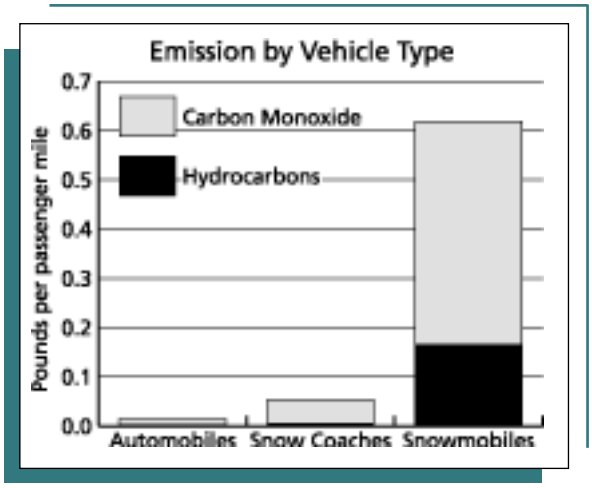
In January 1999 the National Park Service received a petition from the Bluewater Network, a coalition of environmental organizations, requesting it to begin immediate rule making to prohibit snowmobile use within units of the national park system. This petition sparked the process of gathering information concerning such things as snowmobile use patterns, known impacts on park resources and values from use, and what monitoring, if any, was being conducted at parks. In February 2000 the National Park Service held a two-day snowmobile "summit," which was attended by both Department of the Interior officials and superintendents from parks with snowmobile use. The summit provided a chance to review the information that had been gathered over the previous year and to evaluate information on the environmental impacts from snowmobile use. During the summit, representatives from the NPS Natural Resource Program Center shared summaries of literature surveys from their respective areas of expertise and presented available data concerning possible environmental impacts (i.e., impacts to air and water quality, the soundscape, and wildlife).

In April 2000 the Department of the Interior held a press conference to announce that the Park Service would significantly reduce recreational snowmobile use in national parks. The following month, the Assistant Secretary for Fish and Wildlife and Parks testified on behalf of the Park Service at both House and Senate hearings. Representatives from the snowmobile industry, outdoor recreation associations, local communities, and environmental organizations also testified. Congressional interest in this issue is expected to remain high throughout 2001.

In order to ensure compliance with the monitoring requirement of the executive orders, the Natural Resource Directorate has been working with the Operations Directorate on the design and development of a monitoring plan for parks with snowmobile use. Protocols for monitoring air, water, soundscape, and wildlife impacts are currently being developed. The NPS Inventory and Monitoring Program, for which funds have been requested as part of the Natural Resource Challenge, may provide an initial framework for parks to begin building a strategy for monitoring snowmobile use and impacts. In addition the Water Resources Division will be implementing a study in 2001 and 2002, funded through the Recreational Fee Demonstration Program, of the presence or absence of snowmobile contaminants in water resources at some of the parks currently allowing snowmobile use.

In 2000 the Park Service initiated the rulemaking process for the phaseout of snowmobiles at Yellowstone National Park in accordance with Yellowstone's Winter Use Plan Record of Decision. The final rule was published in the *Federal Register* on 22 January 2001. Further rule making for the remainder of the parks with snowmobile use has been initiated, but had not been released for public comment at year's end.

Discussions surrounding winter uses of our national parks such as snowmobiles will continue into the future. With the natural resource information and data gathered from monitoring programs, NPS managers will be better equipped to make informed decisions by knowing the nature and extent of winter use impacts on park resources and values.



▲ **How polluting are snowmobiles?** On a per-passenger-mile basis, 39 automobiles or 11 snow coaches produce as much total pollution as one snowmobile. One snowmobile produces about 98 times more hydrocarbons and 36 times more carbon monoxide than one automobile, or about 31 times more hydrocarbons and 9 times more carbon monoxide than one snow coach. NPS Air Resources Division

Notes

- Automobile, snow coach, and snowmobile passengers per vehicle, respectively, are 2.6, 7.6, and 1.2 (Yellowstone NP).
- Emission estimates vary depending on vehicle operating conditions such as speed and temperature and whether the measurements are conducted in the field or in a laboratory.
- Emission estimates for the following vehicles are based on the following sources: Automobile—EPA Mobile 5 model; snow coach—EPA publication AP-12, volume 11, appendixes H and J; snowmobile—tests conducted by the Southwest Research Institute, and an assumed four-hour, 100-mile trip.
- Particulate matter and nitrogen oxide emissions are much lower than carbon monoxide and hydrocarbons and are not included in the graph.

EPA asked to restore and protect air quality in parks

On 19 July 2000 the Department of the Interior asked the Environmental Protection Agency (EPA) for a rule to restore and protect air quality–related values in national parks and wilderness areas (Class I areas). The Department also requested more immediate action to reverse deteriorating air quality trends at Great Smoky Mountains and Shenandoah National Parks and Blue Ridge Parkway. The National Park Service has documented that air quality–related values are being adversely affected by air pollution at numerous national parks and wilderness areas, such as acidification of streams, surface waters, or soils at Shenandoah, Sequoia–Kings, and Great Smoky Mountains National Parks; visibility impairment in many parks and wildernesses; and damage to foliage from ozone at a number of parks and wildernesses, including Great Smoky Mountains, Shenandoah, Sequoia–Kings, and Yosemite National Parks. In other areas it is strongly suspected that resources are, or may soon be, damaged by air pollution (e.g., increasing nitrate deposition at Rocky Mountain National Park, where episodic acidification already occurs; possible symptoms of ozone injury at some parks on the Colorado Plateau). The EPA extended the public comment period regarding the rulemaking request, and a related request from several northeastern states, until 2 April 2001.

On a related matter, Shenandoah National Park hosted a September meeting among EPA, Shenandoah, Great Smoky Mountains, USDA Forest Service, and U.S. Fish and Wildlife Service representatives to further discuss the air pollution problems in parks and wilderness areas, and to discuss short-term (one to three years) and long-term (three to five years) expectations and actions. In the short term, the EPA will issue guidance to the states regarding the need to look more closely at impacts on parks. In the long term, the EPA will consider information the National Park Service and others submit during the public comment period before deciding on a course of action.

▲ **Ozone-injured** tall milkweed, Great Smoky Mountains National Park.

Zion's new transportation system and visitor center receive accolades

The Zion Canyon Transportation System kicked off with a grand opening on 26 May 2000. The mandatory shuttle system, required for motorized travel up the 6-mile scenic Zion Canyon, exceeded all expectations for its inaugural year. The 2000 operational period continued until 29 October, during which time more than 1.5 million passengers boarded the system. Each full shuttle bus, carrying 66 people, replaced 25 cars that previously would have clogged the canyon. Ninety percent of all visitor comments received were positive. In addition, resource benefits in the canyon included a return to a more natural sound environment, restoration of roadside vegetation, an increase in wildlife sightings, and improvement in the area's air quality. Shuttle operation for 2001 will start up again on 1 April, with the hope to extend the operational period later in autumn.

An integral element of the transportation system is the new 10,000-square-foot Zion Canyon Visitor Center complex, which was designed by the National Park Service and the U.S. Department of Energy's National Renewable Energy Laboratory. Sustainability was a key element in the design of the complex, which incorporates the area's natural features and energy-efficient concepts. It also uses daylighting strategies, photovoltaics, an advanced energy management system, passive downdraft cooling towers, Trombe walls for solar heating, energy-efficient landscaping, and other green systems. In its first year of operation the new visitor center consumed 80 percent less energy than a standard building of its size. In December 2000 the visitor center received an award from the journal *Energy User News* under the public spaces category in the 2000 Efficient Building Awards Program.

▲ **Shuttle bus** at Weeping Rock, Zion National Park, Utah.

Restoring a Watershed

Applying new technology to mitigate acid mine drainage in the Northeast

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For decades the water quality of the Monongahela River and its tributaries in Pennsylvania has been impacted by the vast amount of coal mining in the region. One of the areas affected by this legacy is Friendship Hill National Historic Site (NHS) near Point Marion, Pennsylvania. An abandoned drift mine in the southeast corner of the park has been the discharge location for acidic water generated by oxidation of pyrite in the abandoned mine workings. This drainage has severely polluted Ice Pond Run, which flows through the park for almost 2 miles. Only species of invertebrates and plants that are tolerant of acid mine drainage can survive in the highly acidic environment. Although resolving this resource management problem has been a high priority throughout the past decade, until this year a feasible solution has been elusive.

Fortunately, a resourceful partnership that integrates the work of scientists from several organizations has brought new hope for the reclamation of Ice Pond Run. The partners include the National Park Service; the U.S. Geological Survey Biological Resources Division (USGS/BRD) Leetown Science Center (Kearneysville, West Virginia); the Conservation Fund's Freshwater Institute; the Pennsylvania Department of Environmental Protection; and California University of Pennsylvania. In July 2000 the partners began diverting up to 60 gallons per minute of flow in Ice Pond Run for treatment at a facility using a process recently developed by the USGS. Funding for this research—which is the first full-scale application of the new process—has been contributed primarily by the USGS Natural Resources Preservation Program. Additional funding was provided by a generous grant from Canon U.S.A., Inc., through the National Park Foundation.

The innovative treatment process comprises eight distinct phases, but at the heart of the technology are four pulsed-bed limestone reactors. After the acid mine drainage has been saturated with carbon dioxide, pumps alternately force it to flow between two pairs of limestone columns in a pulsed cycle of 60 seconds. The highly acidic water comes into contact with a form of limestone commonly referred to as "glass sand." At most sites using conventional fixed-bed reactors, a process called armoring (formation of an impervious coating) prevents limestone from being dissolved. However, the fluidization that results from using pulsed-bed reactors creates a highly energized environment where particle abrasion hinders armoring. The high quantities of free carbon dioxide and limestone then buffer the water's pH, an essential step in the mitigation process.

Attempting to use this active treatment strategy in a remote location created several challenges. Perhaps the best evidence of the partners' resourcefulness is the manner in which they addressed the problem of supplying one of the process's chemical ingredients. The experimental treatment system in some cases requires bulk liquid carbon dioxide, which is expensive. However, neutralizing the acid with limestone produces high quantities of carbon dioxide within the reactors because the acidity of the acid mine drainage at Friendship Hill is extremely high. By modifying the system, researchers have been able to strip excess carbon dioxide from the water and recycle it at a rate that eliminates the need to purchase the chemical from outside sources. In fact, this facility is capable of capturing and reusing about 70,000 pounds of carbon dioxide per year. Additional carbon dioxide is available, when needed, in the exhaust from an on-site propane-powered electrical generator.

▲ **Ice Pond Run** at Friendship Hill National Historic Site has been severely polluted by acid mine drainage until recent use of an innovative treatment process. Water is diverted into four pulsed-bed limestone reactors that buffer its pH before returning it to the run. As the stream begins to recover, yellow iron precipitate falls out of solution with a rise in pH.

In terms of this research facility's early performance, from July through September 2000 the plant had already processed 3.3 million gallons of acid mine drainage, consumed 30,000 pounds of limestone in its reactors, and removed 250,000 pounds of wet sludge (metal hydroxide precipitates). Over a three-year period the partners will monitor the effects of the treatment on water quality, aquatic macroinvertebrates, and fish. Those results will be compared with the characteristics of a reference stream (Dublin Run). As the operation and monitoring of the treatment plant proceed, the National Park Service welcomes scientific investigators, educators, and students to take advantage of the unique opportunities to study and teach others about this ecosystem and the detrimental effects of acid mine drainage.

Of course, reclaiming Ice Pond Run is just the first goal of the partners who have constructed this demonstration facility. In southwestern Pennsylvania alone, three of the four units in the National Park Service supervised by Superintendent Joanne Hanley are affected by acid mine drainage. As she has observed, "With this important research project, we can monitor the new treatment technology developed by the U.S. Geological Survey and determine its effectiveness in restoring good water quality and biological diversity to severely polluted park water resources." Because the National Park Service protects and restores the quality of all surface and ground waters, the application of the pulsed-limestone technology at Friendship Hill National Historic Site has clearly assumed national importance.

Geoindicators: A tool for monitoring and understanding ecosystem change in parks

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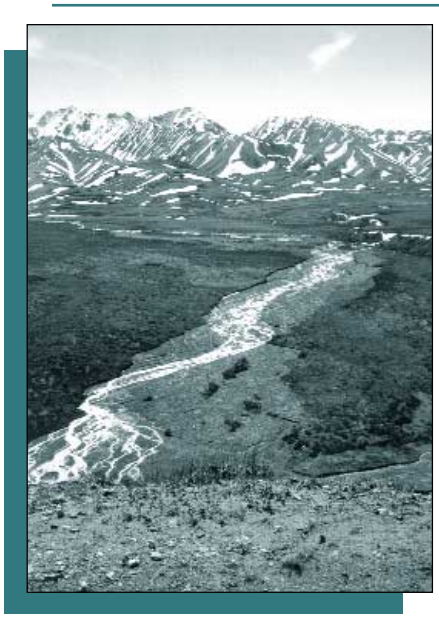
In 2000 the Geologic Resources Division introduced geoindicators to NPS resource management as a new ecosystem management tool. Geoindicators are measures (magnitudes, frequencies, rates, trends) of physical processes on the earth's surface that may undergo significant change in less than 100 years and be affected by human actions. These indicators, developed by the International Union of Geological Sciences, provide a science-based method to assess rapid change in the natural environment.

The geoindicator tool is a checklist that enables parks to identify geologic and hydrologic processes that help evaluate the state of the environment, changes in ecosystems, and effects of humans on natural systems. The easy-to-use checklist includes 27 indicators selected for ecological importance. Some indicators are single parameters such as shoreline position, and others are aggregates of several measures such as parameters of groundwater quality. Examples include dune formation; groundwater level; karst activity; soil and sediment erosion; and extent, structure, and hydrology of wetlands. The tool provides separate criteria for each geoindicator so the user can determine the importance of the indicator for specific natural systems.

Geoindicators help answer NPS resource management questions about what is happening to the environment, why it is happening, and whether it is significant. They may also be used to establish baseline conditions and trends so that human-induced changes can be identified. In 2000, geoindicators were successfully integrated into several NPS projects to obtain science-based information for resource management.

The year 2000 was the pilot year for the NPS Strategic Plan goal Ib4, the identification of human influences on geologic processes. This goal entails the combined expertise of park personnel and geologists to identify natural, earth-system processes that are being influenced by humans. In September the first scoping meeting for this goal was conducted at Craters of the Moon National Monument, Idaho, involving staff from the park, the Geologic Resources Division, and the USGS. The geoindicator checklist was a focal point of the meeting, which identified critical geologic components of the park ecosystem for long-term ecological monitoring and research. Over the next five years, parks throughout the national park system will be using geoindicators to conduct ecological assessments, evaluate monitoring needs, and meet strategic goals.



In Denali National Park, Alaska, and other units of the national park system, stream channel morphology and sediment load are geoindicators that can reflect changes in basin conditions, including climate, soils, erosion rates, vegetation, topography, and land use. Fluctuations in sediment discharge affect a great many terrestrial and coastal processes and ecosystems, because nutrients are transported together with sediment.

Geoindicators are also being integrated into the park vital signs monitoring program for NPS Strategic Plan goal Ib3 to identify geologic "vital signs" of ecosystem condition in the 32 monitoring networks and individual parks. In April 2000 the concept was introduced as an assessment tool at the Northeast Barrier Network's Vital Signs Scoping Meeting. The checklist and criteria were used during the meeting to evaluate options for monitoring, and shoreline position was selected as a critical ecological indicator.

Also in 2000, the NPS Inventory and Monitoring Program initiated work on development of a handbook for natural resource monitoring. In August the Geologic Resources Division drafted a chapter on geologic resource monitoring that includes the geoindicator concept.

Geologic Resources summit held

In April the Geologic Resources Division convened a workshop of NPS resource managers and geology specialists to focus on integrating geosciences into park planning and natural systems management. About 70 NPS staff participated, representing more than 40 parks and six regions. Sessions ranged from geologic education to regulatory compliance to ecosystem restoration. The workshop included breakout sessions by region and theme, covering caves, fossils, geologic hazards, shorelines, NPS extraction of sand and gravel for administrative purposes, and disturbed lands restoration. The summit delineated park resource management and research needs and helped define the priorities and future direction for the geology program.

Science-based Decision Making

Implementing the National Parks Omnibus Management Act of 1998

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Title II of the National Parks Omnibus Management Act of 1998 explicitly directs the National Park Service to use a broad program of the highest-quality science and information in managing and protecting units of the national park system. Park administrative records must reflect this mandate. In 2000 the Park Service undertook several important steps to integrate this important language into its management actions.

Foremost, NPS *Management Policies 2001*, released 27 December 2000, contains direction for enhanced decision making that reflects the highest-quality science and information. In particular, park decision makers must now preface decisions to approve a proposed activity with a written finding that the activity will not impair park resources and values.

To provide assistance to park decision makers, the Natural Resources Directorate kicked off an effort to develop detailed guidance on needed scientific information and analyses underlying the written finding on nonimpairment called for in *Management Policies 2001*.

New guidance (NPS-12) on implementing the National Environmental Policy Act (NEPA) and the new NPS companion NEPA Handbook both explain and provide guidance on the interrelationship of the Omnibus Act with NPS responsibilities under NEPA.

The NPS course titled Integrating NEPA into NPS Activities provides participants with a solid understanding of the science mandate contained in the Omnibus Act and the interface of this act with NEPA.

The Natural Resources Law and Policy Course for Superintendents now contains a session on the act and the duties it places on park managers in making well-reasoned, informed decisions.

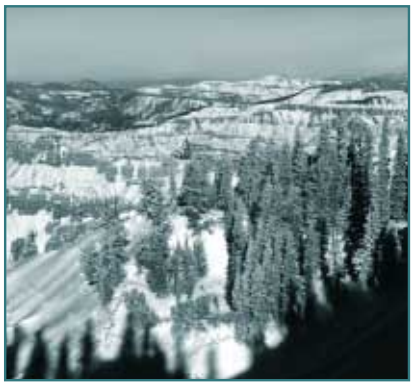
> *"Park decision makers must now preface decisions … with a written finding that the activity will not impair park resources and values."*

The National Park Service continued its efforts to systematically inventory and monitor park resources to establish baseline information and provide information to park decision makers about the long-term trends in the condition of park resources. The Park Service also received a funding increase of $7.3 million in its base budget to accelerate completion of baseline park resource inventories. With this increase the Park Service plans to complete all inventories, except for vegetation mapping, in seven to eight years. Funding for mapping vegetation in all parks outside of Alaska is being provided by the USGS Biological Resources Division.

In addition, in 2000 the NPS Natural Resources Advisory Group examined a variety of options for integrating the Omnibus Act into day-to-day park management, and the National Leadership Council affirmed the need for the Park Service to thoroughly embrace the act's science mandate.

Utah parks water rights agreements signed

On 18 April 2000, representatives from the Utah Department of Natural Resources, Utah Attorney General's Office, National Park Service, Department of the Interior's Office of the Solicitor, and Department of Justice signed water rights settlement agreements for Cedar Breaks National Monument and the Utah portion of Hovenweep National Monument. The agreements, which quantify reserved water rights and establish protective administrative mechanisms, must be submitted to the adjudication court for approval. In the interim the Utah state engineer has agreed to enforce the settlement conditions. The parties hope to use these two agreements as a template to quickly resolve water rights issues at many other park units in Utah not directly associated with the mainstem Green and Colorado Rivers.



▲ **Cedar Breaks** National Monument, Utah

Prudential algebra

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Some 229 years ago, Benjamin Franklin realized that even with a plethora of information, its utility was for naught without a systematic means of full consideration. His letter to a friend (see page 49) introduces Franklin's moral or prudential algebra, known today as decision science.

Decision science is a field of applied cognitive psychology. It attempts to understand and improve human reasoning and the systematic integration of diverse information for the purpose of improved decision making.

The dilemma is that, although the world is enormously complex and science continues to add to this enormity, the human brain has a limited capacity to store, recall, analyze, and interpret information. A recent analogy might be helpful: communications technology and 24-hour political analyses greatly increased the amount of information about the presidential candidates reaching our homes, but it seems we forgot to upgrade the voting box. Decision science is about improving the voting box and is as applicable to natural resource management in the national parks as it is to politics.

"Today's decision science will help guarantee that the increasing volume of scientific information will be used intelligently by decision makers."

The vast majority of federal land litigation is based on lack of compliance with the National Environmental Policy Act (NEPA) and Administrative Procedures Act (APA). NEPA gives procedural guidance on how to make complex decisions, which is further embellished by NPS planning guidance. APA gives substantive guidance by directing that all decisions not be arbitrary, although operational details on how to meet this responsibility are limited.

The Federal Interagency Task Force on Visitor Capacity on Public Lands was initiated by the Assistant Secretary of the Interior in July 2000. At first glance the charge of the task force is to help resolve the old "visitor carrying capacity" question in parks and on other federal lands, but a close examination reveals an effort to develop tools for making decisions that are not arbitrary but based upon decision science.

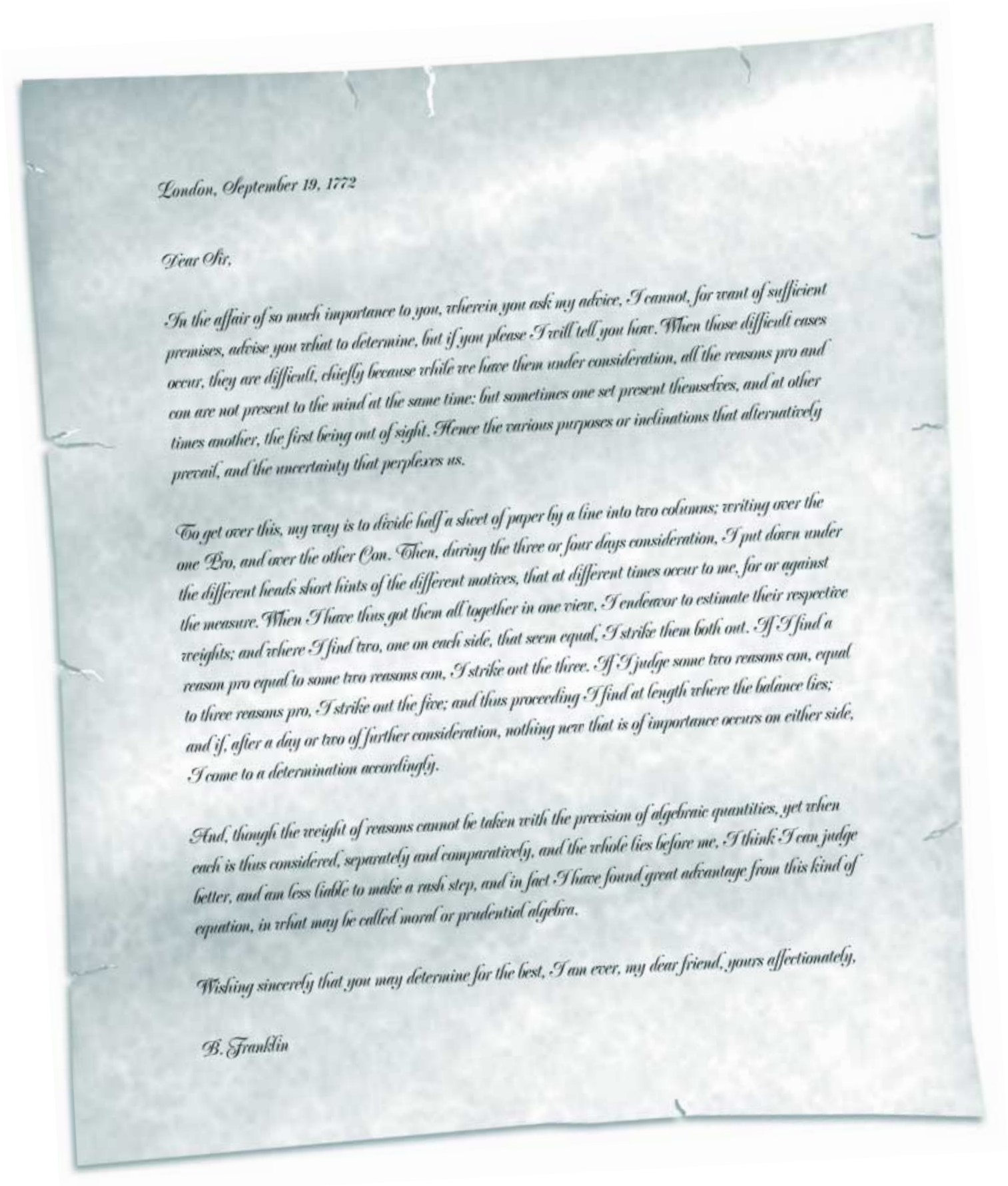
The approach is simple. Arbitrary decisions are those without principle and reason. Thus the task force is developing an explicit set of principles and reasons (i.e., decision criteria) that can guide decision making, along with decision-making protocols that will help ensure, and document for the administrative record, a reasoned and systematic integration of science, circumstances, and assumptions defining a particular situation.

The goal of the task force is ambitious. It is intended to improve the substantive guidance to make better decisions; to improve the clarity of NPS plans; and to increase public understanding and support, and managerial confidence and resolve to make the difficult decisions.

Will this effort reduce judicial challenges? No, not in the short run, because complex, new, and controversial decisions such as visitor capacities will always stimulate a body of case law initially. But our judicial system operates on the principle of judicial deference—that is, administrative decisions should be made by the responsible person and not by the courts. Thus the strategy is that the courts will defer to NPS decision making if we can demonstrably ensure that principled and reasoned decisions are made through a NEPA-compliant planning process.

Benjamin Franklin's prudential algebra and today's decision science will help guarantee that the increasing volume of scientific information will be used intelligently by decision makers.

NPS



London, September 19, 1772

Dear Sir,

In the affair of so much importance to you, wherein you ask my advice, I cannot, for want of sufficient premises, advise you what to determine, but if you please I will tell you how. When those difficult cases occur, they are difficult, chiefly because while we have them under consideration, all the reasons pro and con are not present to the mind at the same time; but sometimes one set present themselves, and at other times another, the first being out of sight. Hence the various purposes or inclinations that alternatively prevail, and the uncertainty that perplexes us.

To get over this, my way is to divide half a sheet of paper by a line into two columns; writing over the one Pro, and over the other Con. Then, during the three or four days consideration, I put down under the different heads short hints of the different motives, that at different times occur to me, for or against the measure. When I have thus got them all together in one view, I endeavor to estimate their respective weights; and where I find two, one on each side, that seem equal, I strike them both out. If I find a reason pro equal to some two reasons con, I strike out the three. If I judge some two reasons con, equal to three reasons pro, I strike out the five; and thus proceeding I find at length where the balance lies; and if, after a day or two of further consideration, nothing new that is of importance occurs on either side, I come to a determination accordingly.

And, though the weight of reasons cannot be taken with the precision of algebraic quantities, yet when each is thus considered, separately and comparatively, and the whole lies before me, I think I can judge better, and am less liable to make a rash step, and in fact I have found great advantage from this kind of equation, in what may be called moral or prudential algebra.

Wishing sincerely that you may determine for the best, I am ever, my dear friend, yours affectionately,

B. Franklin

The unprecedented 2000 fire season

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Extreme fire intensity and rapid rates of spread characterized the beginning of the 2000 fire season, one that would become unprecedented in the history of wildland fire management in the United States. Drier-than-normal winters and summers of normal to above-normal temperatures and below-normal precipitation over the past two to three years created the severe fire conditions.

The season began in May with the Cerro Grande fire, which occurred as a result of an escaped prescribed fire in Bandelier National Monument, New Mexico. It threatened and impacted high-value resources, including property and developments in the park and Santa Fe National Forest, at Los Alamos National Laboratory, in the towns of Los Alamos and White Rock, and in Santa Clara Pueblo. Losses were extreme and 235 structures were destroyed. A board of inquiry convened by the National Park Service to draw conclusions about this fire and its management had not completed its activities by year's end.

Wildland fire activity escalated dramatically in the Southwest and rapidly progressed northward in late May and June. Demands for fire fighting and emergency rehabilitation increased in mid-June and continued into July because of Cerro Grande and the number and size of fires burning in Colorado, Utah, and Nevada. The timing and completion of rehabilitation were critical to mitigate potential adverse impacts to ecosystems, such as erosion, from the eventual wet season. By the end of July, fire activity rose to an unparalleled level in the northern Great Basin and northern Rocky Mountains.

"Fire behavior and growth routinely exceeded initial attack capability."

Fire behavior and growth routinely exceeded initial attack capability. Scores of fires ignited daily, taxing the ability of the wildland fire management agencies to control the blazes quickly. When August arrived, needs for management teams, crews, engines, and aircraft markedly exceeded the nation's total resources. As the need to protect life and property increased, large fires could not be staffed adequately. The situation was comparable to or even exceeded the historic 1910 fire season in Idaho and Montana.

The number of wildland fires in 2000, though not the greatest on record, was 90,821 for all wildland fire management agencies. Of these, 886 occurred on lands of the national park system and burned 114,578 acres (46,404 hectares); nearly one-fourth of all units in the national park system (92) reported a fire. In addition to suppressing fires the National Park Service managed 131 wildland fires for resource benefits on 49,253 acres (19,947 hectares). More importantly, in proportion to the magnitude of the fire activity, the safety record during this season was possibly the best ever.

▲ **Wildfires burned throughout the western United States** and in nearly one-fourth of the units of the national park system in 2000. The severe fire season led to a review of national fire policy and resulted in a plan to increase federal fire-fighting capabilities.

This extreme fire season prompted several actions to strengthen wildland fire management capability. After the Cerro Grande fire, the Secretary of the Interior formed a team to review the applicability and implementation of the 1995 Federal Wildland Fire Management Policy and to recommend improvements. During the season a new level of international cooperation developed as firefighters and equipment were contributed by Canada, Mexico, New Zealand, and Australia to aid efforts in the western United States. Also, President Clinton and Congress initiated a plan to dramatically increase fire-fighting capabilities of federal agencies, manage hazardous fuels in the wildland-urban interface, and provide greater support to cooperating rural fire organizations.

In response to the President's proposal, called the National Fire Plan, the National Park Service will increase its preparedness in 2001 by adding new firefighters, helicopter contracts, helitack crews, and other resources. Through an infusion of funds it will also improve fuels management in areas of risk in the urban-wildland interface and complete emergency and long-term rehabilitation of burned areas. Finally, it will provide assistance to rural fire protection organizations located near units of the national park system in order to increase personal safety and fire-fighting capability. Other federal agencies will be responding in similar fashion.

Award-Winner Profile

Redwood superintendent receives award

▲ **Andrew Ringgold**

In June 2000, Andrew Ringgold, superintendent of Redwood National Park, received the 1999 Director's Award for Superintendent of the Year for Natural Resource Stewardship. Andy was recognized for consistently providing outstanding and innovative leadership in protecting the natural resources of Redwood National and State Parks. He accomplished this by developing and strengthening partnerships with state, local, and federal agencies as well as with private landowners and conservation organizations. Andy developed collaborative relationships with the Yurok Tribe and identified and obtained funding to support park resource management programs through nontraditional sources.

According to Andy, one of his most significant accomplishments was developing a partnership with the California Department of Parks and Recreation. He noted that partnership "forms the basis for managing and protecting Redwood National Park and the three state parks within its boundary as a complex of parks [Redwood National and State Parks], blurring administrative boundaries and managing resources on an ecosystem basis."

The award also singles out the General Management Plan (GMP)/General Plan for Redwood National and State Parks, which was completed under Andy's leadership in 1999–2000. It also firmly established natural and cultural resource stewardship as the primary emphasis of the parks. The plan called for many actions, including eliminating or phasing out all off-road vehicle use on beaches, strengthening watershed restoration efforts, initiating second-growth forest management, restoring prairies, and restoring and maintaining cultural landscapes.

Andy felt honored by the award. He said, "The award is the greatest honor I've received in my 34-year NPS career. In a region known for its emphasis on resource stewardship and in an organization with many, many highly talented professional managers dedicated to protecting park resources, it is very special to be recognized." Andy also gives credit to his staff: "I am very fortunate to have the opportunity to work with a staff as talented as the one at Redwood. With such a staff, I believe it would be very difficult for a superintendent not to be successful at protecting park resources."

Rare sea turtles nest at Cape Hatteras

▲ **The leatherback** turtle differs from other sea turtles in having a black, leathery shell divided by seven longitudinal ridges.

Cape Hatteras National Seashore staff and volunteers located 84 sea turtle nests in the North Carolina park in 2000. Most of the nests were laid by loggerhead sea turtles (*Caretta caretta*), although four green sea turtle (*Chelonia mydas*) nests were also found. Both turtle species are classified under federal law as threatened.

The most unusual sea turtle to nest on Cape Hatteras in 2000 was the leatherback turtle (*Dermochelys coriacea*), a federally endangered species. The leatherback is the largest marine turtle, often exceeding 1,000 pounds. It typically breeds in the tropics but is often found foraging in North Atlantic waters. Three leatherback nests were laid in the national seashore, two on Ocracoke Island and one on Hatteras Island. A fourth nest was discovered in Cape Lookout National Seashore.

Leatherback nesting was first recorded at Cape Hatteras in 1998. Because adult females nest every two years and may lay several nests each breeding season, this year's nests could have been laid by the same female. Leatherback turtles venturing far out of their normal nesting range often lay infertile eggs. However, two of the nests laid on the Outer Banks this year were fertile. The eggs at Cape Lookout only partially developed. A fertile nest, located near Hatteras village, produced 86 hatchlings. Little is known of hatchling behavior and movements.